REMARKS

Claims 1, 2 and 4-6 are pending in the application. Claim 6 has been added, whose support is found in page 12, lines 23 of the specification. Claims 4 and 5 have been withdrawn from further consideration.

(1) Claims 1 and 2 were rejected under 35 U.S.C. §103(a) as being unpatentable over Nowobilski et al. (U.S. Patent No. 4,726,974), in view of Heffelfinger et al. (U.S. Patent No. 5,987,833).

(i) The Examiner states as follows:

> **Nowoilski et al. fail to disclose binder coating amount in the range of 0.5 to 1.5wt%. Heffelfinger et al. teaches less than 1% by weight of binder based on the weight of glass in the insulation product (col. 5 lines 5-6) which is within applicant's claimed range of 0.5-1.5wt% for the purpose of providing fibers that are capable of much greater movement (col. 5 line 1-2).**
>
> **Therefore, it would have been obvious to one having ordinary skill in the art at the time applicant's invention was made to provide Nowobilski with 0.5-1.5 by weight of binder based on the weight of glass in the insulation product in order to provide fibers that are capable of much greater movement (col. 5 line 1-2) as taught by Heffelfinger et al.**
>
> **(page 3 of the outstanding Office Action. Emphasis added.)**

However, Heffelfinger's teaching does not correspond to the claimed "molded product," and rather, Heffelfinger et al. are teaching away from molding the "binderless fiber" by heat pressing, as explained below.

(ii) Heffelfinger et al. disclose as follows:

> **Prior art insulation batts generally include a binder. The presence of the binder holds the prior art fibers into a compressible, but rigid predefined matrix. Fibers held by binder are incapable of movement beyond the pre-defined matrix. Thus, an insulation employing binderless mineral fibers will be capable of much greater movement than more rigid bindered fibers. As used in the present specification and claims, the term "binderless" means the absence of binder materials or the presence of only small amounts of such binder materials, amounting to no more than one percent (1%), by weight of the insulation product. Addition of lubricants or suppressants, e.g. oils, for lubrication of fiber-to-fiber contacts, dust control or other purposes is not considered a binder.**
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> **(Col. 4, line 63 to col. 5, line 10 of Heffelfinger et al. Emphasis added.)**

> **After the envelope 12 is ruptured, the batt 14 begins to recover, expanding away from the vapor barrier 24 as the air in the cavity 66 infiltrates into the envelope 12 through the opening 74, as seen in FIG. 3B. The extra material in the back sheet 38, which was preferably formed into the pleats 61, accommodates the expansion of the batt 14.**
>
> **As the batt 14 expands, an obstruction such as the pipe 68 may be encountered. Due to the conformable nature of the long binderless fibers of the preferred embodiment of the batt 14, the insulation assembly 10 expands to substantially fill the cavity 66, conforming about the outer surface of the pipe 68, as shown in FIG. 3C.**
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> **(Col. 13, lines 7-18 of Heffelfinger et al. Emphasis added.)**

Heffelfinger et al. clearly teach the "binderless fiber" allowing much greater movement of the mineral fibers than more rigid bindered fibers. Heffelfinger et al. disclose in Figs 3A to 3C that when the envelope 12 is ruptured, the batt 14 including the "binderless fiber" is expanded to fill the cavity 66 (col. 13, lines 7-19). In the invention of Heffelfinger et al., the movement of the "binderless fiber" should not be restricted or molded.

(iii) Claim 1 recites as follows:

> **wherein <u>the core material is a molded product</u> obtained by coating a resin binder on inorganic fibers having an average fiber diameter in the range of from 3 to 5 μm at a coating amount in the range of from 0.5 to 1.5 wt % relative to the fibers and applying heat pressing to the inorganic fibers, <u>or a laminate</u> fabricated by stacking two or more sheets of the molded product.**
>
> **(Instant claim 1 of the present application. Emphasis added.)**

In the present invention, because the "molded product" is obtained by the claimed process, the inorganic fibers are restricted to move. In this respect, the Examiner states that applying heat pressing or stacking two or more sheets of the molded product is a process limitation. However, the claimed "molded product" obtained by the claimed process is not the same as or obvious from the freely expandable "binderless fibers" taught by Heffelfinger et al. By applying the heat

pressing to the inorganic fibers having the coating of the resin binder, the molded product of the present invention can be formed such that the inorganic fibers are restricted to move.

If the "binderless fiber" of Heffelfinger is molded by heat pressing, the movement of the inorganic fibers is clearly restricted, making the Heffelfinger's invention inoperable. Especially when the "binderless fiber" includes a resin binder, the batt or the "binderless fiber" cannot be expanded to fill the cavity, as disclosed by Heffelfinger et al.

Therefore, because the claimed "heat pressing" limitation makes materially different product from the "binderless fiber" taught by Heffelfinger et al., the process limitation should be considered. Thus, the claimed molded product of the inorganic fibers is different from Heffelfinger et al. To use the claimed molded product obtained by the heat pressing makes the Heffelfinger's invention inoperable. Thus, Heffelfinger et al. teach away from Nowobilski et al., prohibiting the combination of the two references.

(iv) In addition, Nowobilski et al. teach providing a smoothened surface on the shaped articles of the fiberglass fibers by adding a binder at an amount of 5 wt% to 30wt%, or preferably 10 wt% to 20 wt% (col. 3, lines 1-7 of Nowobilski et al.). If Nowolbilski is modified to use the "binderless fiber" in accordance with Heffelfinger et al., a smoothened surface as taught by Nowobilski et al. cannot be obtained. Thus, Nowolbilski et al. also teach away from using the

"binderless fiber" as taugh by Heffelfinger et al., and also, it is not obvious to one skilled in the art at the time the invention was made to modify Nowobilski et al. in view of Heffelfinger et al. while providing a smoothened surface of the shaped product of the fiberglass fibers.

(v) Also, the claimed range of the coating amount shows unexpected results over the range disclosed by Nowobilski et al. Nowobilski et al. discloses as follows:

> **The fiberglass fibers of the shaped article are held together by binder which comprises from 5 to 30, preferably from 10 to 20 weight percent, of the shaped article. Preferably the binder is a phenolic type binder. The binder serves to provide a smoothened surface on the shaped article and also serves to keep the individual fibers in place. This reduces the chance of a fiber piercing the enclosure or entering the edge seal of the enclosure and thus enhances the integrity of the vacuum panel of this invention. Among other binders useful in the panel of this invention, one can name silicone type binders and inorganic sodium silicate type binders.**
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> **(col. 3, lines 1-12 of Nowobilski et al. Emphasis added.)**

Nowobilski et al. teach that the binder amount is preferably 10 to 20 weight percent of the shaped article, in view of the smoothened surface of the shaped article.

On the other hand, claim 1 recites that the coating amount of the resin binder is in the range of from 0.5 to 1.5 wt % relative to the fibers. In this respect, the Applicants repeatedly argue the unexpected results of the claimed coating. For the Examiner's convenience, Table 1 in the specification is listed below:

Binder coating amounts (wt%)	Thermal conductivity (W/m・K)			
	Initial values	7 days	30days	50days
None	0.00207	0.00248	0.00253	0.00376
0.5	0.00207	0.00249	0.00299	0.00404
1.0	0.00210	0.00249	0.00334	0.00445
1.5	0.00220	0.00251	0.00342	0.00461
3.0	0.00289	0.00331	0.00430	0.00578
10.0	0.00378	0.00812	0.01182	0.01671

(Table 1 at page 13 of the specification)

Clearly, unexpected results can be found in the claimed coating amount of the resin binder. In the samples whose binder coating amount is from 0.5 to 1.5wt%, the initial thermal conductivity was the same as, or close to, that of the sample without the resin binder coating ("None" in Table 1). Such an excellent thermal conductivity could have been maintained for 50 days in the present invention. On the other hand, the thermal conductivity and its maintenance were poor in the samples whose coating amounts were 3.0 and 10.0 wt%, and the thermal conductivity significantly increased after 50 days. In particular, please compare the results of 10.0wt% with 0.5 to 1.5wt%. The sample of 10.0wt% corresponds to Nowobilski's preferable lower limit (col. 3, lines 2-3). These superior results were unexpected, because Nowobilski et al. do not teach improvement of the thermal conductivity by reducing the amount of the binder. Thus, because the claimed coating amount of the resin binder showed unexpected results over Nowobilski et al., claim 1 is not obvious over the references.

Newly added claim 6 recites a resin used in the Examples in the specification. Claim 6 is not obvious over the cited references.

(vi) The Applicants repeatedly argued the unexpected results in the Response filed on September 21, 2006 and March 7, 2007, but the Examiner has not responded to the Applicants' arguments about the unexpected results. The Examiner is requested to reconsider the application also in view of the Applicants' arguments, and withdrawal of the rejection is respectfully requested.

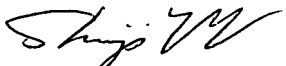
(vii) Also, as supported at Table 2 at page 15, in view of the surface profile, the handability and the insertability, the binder coating amount of 10wt% is preferable. Nowobilski et al., therefore, teach that 10.0wt% is the preferable lower limit (col. 3, lines 2-3). Nowobilski et al. also teach that the binder serves to provide a smoothed surface. At least in view of the surface profile, it is not a general way for one skilled in the art to reduce the amount of the coating amount. Thus, the claimed range of the binder coating amount is not obvious over Nowobilski et al.

(3) In view of the aforementioned amendments and accompanying remarks, Applicants submit that that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date. If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned representative at the telephone number indicated below to arrange for an interview to expedite

the disposition of this case. If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP



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